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Samarina, Anna; Bezemer, Dirk

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Visiting address:
Nettelbosje 2
9747 AE Groningen
The Netherlands

Postal address:
P.O. Box 800
9700 AV Groningen
The Netherlands

T +31 50 363 7068/3815

www.rug.nl/feb/research



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Anna Samarina

Faculty of Economics and Business, University of Groningen

h.samaryna@rug.nl

Dirk Bezemer

Faculty of Economics and Business, University of Groningen

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Anna Samarina* Dirk Bezemer

University of Groningen

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Abstract

The share of domestic bank credit allocated to non-financial business declined significantly in EMU economies since 1990. This paper examines the impact of capital inflows on domestic credit allocation, taking account of (future) EMU membership. The study utilizes a novel data set on domestic credit allocation for 38 countries over 1990–2011 and data on capital inflows into the bank and non-bank sectors. We estimate panel models controlling for initial financial development, income level, inflation, interest rate, credit market deregulation and current account positions. The results suggest that the decline in the share of credit to non-financial business was significantly larger in (future) EMU economies which experienced more capital inflows into their non-bank sectors. We discuss implications.

Keywords: financial intermediation; credit allocation; EMU; capital inflows

JEL Classification: F32, F36, G15, G21

*Corresponding author: Faculty of Economics and Business, University of Groningen, PO Box 800, 9700 AV Groningen, The Netherlands. Phone: +31 50 363 3689; Email: h.samaryna@rug.nl.

1 Introduction

European Economic and Monetary Union (EMU) from 1999 fueled large capital flows from member economies with trade surpluses to member economies with trade deficits. These flows, and the deficits they financed, were regarded as part of the catching-up process of less productive economies, supporting the formation and upgrading of productive capacity (Blanchard and Giavazzi, 2002). Many deficit countries, however, lagged behind in productivity growth and experienced booms in real estate and consumption, rather than in non-financial-business investment. The resulting high debt levels and high dependence on continued inflows left EMU-member deficit economies vulnerable to the 2008 global financial shock, which made capital flows dry up and debt refinancing costly (Obstfeld, 2012).¹

These developments beg questions about the “distinction between productive and unproductive purposes of foreign borrowing on the part of catching-up countries” which “seems to have been lost, at least in the context of EMU” (Giavazzi and Spaventa, 2010, p.7). The distinction has been researched in the recent credit-and-growth literature. A decline in bank credit allocated to non-financial business has been a general trend, as documented by Bezemer et al. (2014). At the same time, an increased lending to households for consumption and mortgages is associated with lower growth and higher probability of external imbalances and crises (Büyükkarabacak and Krause, 2009; Büyükkarabacak and Valev, 2010). In the present paper we focus on the relationship between foreign capital and domestic financial intermediation; more specifically, we examine whether the membership in EMU influences, through capital inflows, the shift away from domestic bank lending to non-financial business.

¹By ‘EMU members’ we mean those EU countries which entered the third stage of EMU by replacing their national currency with the Euro. The creation of EMU was decided in the 1992 Maastricht Treaty. The Euro as a currency was introduced in 1999, initiating the third stage of EMU. 11 countries became EMU members in 1999; Greece joined stage III in 2001, followed by Slovenia in 2007, Cyprus and Malta in 2008, Slovakia in 2009, Estonia in 2011, and Latvia in 2014.

The study utilizes a measure for ‘domestic bank credit allocation’ based on newly collected data, taken from the consolidated balance sheets of Monetary Financial Institutions in 38 countries over 1990–2011. This measure is defined as the share of credit to non-financial business, akin to Giavazzi and Spaventa’s (2010) ‘productive investment’. We observe large declines in this share especially in the run-up to EMU in the 1990s, when capital flows within the future EMU area started to increase.

We estimate system GMM models to test to what extent capital inflows in EMU economies were changing domestic credit allocation. We distinguish between sectoral (bank and non-bank) destination of inflows. Since we use inflows not net flows, we also include current account positions in the analysis. Our findings suggest that a decline in the share of credit to non-financial business was significantly larger in those EMU economies which experienced more capital inflows into their non-bank sectors. Significantly, this effect is already observable in the 1990s, before the monetary union stage of EMU. Non-bank inflows into those economies which were preparing for EMU membership by liberalizing their capital accounts, changed domestic credit allocation relative to other economies. Outside EMU, this impact is observed in deficit economies only. The results imply that the effects of being in EMU should be researched already before formal membership starts, as also Blanchard and Giavazzi (2002) do. They also suggest that there may be costs of financial integration in terms of the productive allocation of domestic bank credit. This merits further research.

The paper proceeds as follows. In section 2 we discuss the channels from capital inflows to domestic credit allocation, and the relevance of current account positions and EMU to this relation. In Section 3 we introduce and explore the data. Section 4 describes the methodology. In Section 5 we present estimation results. Section 6 concludes the paper with a summary and discussion.

2 Capital Flows and Domestic Credit Allocation

Capital flows may have positive effects on growth and external sustainability, provided that they finance productive investment in tradable goods, such that repayment is assured by a future export surplus (Lucas, 1990; Blanchard and Giavazzi, 2002; Eichengreen, 2010). Under these conditions, more financial integration (including monetary union as its extreme) and more capital flows towards catching-up economies leads to faster catch-up growth.

A different scenario may play out if countries are investment-constrained rather than savings-constrained, so that the ability of the domestic financial system to allocate credit productively is limited (Rodrik and Subramanian, 2009; Boissay et al., 2013). Capital inflows may then fuel consumption or real estate booms rather than finance catch-up growth, or may lead to appreciation of domestic currencies, undermining countries' export competitiveness.² Lane (2013) discusses how the nontradables sector rather than the tradables sector tends to expand during a high-deficit phase, through direct borrowing by the domestic non-bank nontradables sector, or through inflows into the banking sector which are transformed into loans to the nontradables sector, or both.

We focus on the allocation of credit, and how this is affected by capital inflows. If capital inflows cause more bank credit towards real estate and for consumption (which have insignificant or negative growth effects) while the share of credit to non-financial enterprises (which robustly increases economic growth) declines, then this is one way in which capital inflows weaken the domestic financial system's role in economic growth.

²Prasad et al. (2007) show that developing and emerging countries which rely more on foreign capital inflows grow more slowly than other countries. Furceri et al. (2012) and Magud et al. (2012) find that large capital inflows significantly increase domestic credit. Additionally, Borio et al. (2011) and Bruno and Shin (2013) show that capital inflows into the domestic banking sector boost bank lending. Negative effects of a high credit growth rate are well researched (Rousseau and Wachtel, 2011; Arcand et al., 2012; Cecchetti and Kharroubi, 2012). Lane and McQuade (2014) examine 54 countries over 1994–2008 and find that net debt inflows increase domestic credit growth. This is particularly evident during the boom period 2003–2008. Mendoza and Terrones (2008), Ostry et al. (2011) and Calderón and Kubota (2012) report that a capital inflow surge causes domestic credit booms. In line with this, 2011 IMF World Economic Outlook surveys 47 economies over 1960–2011 and finds that financial inflows systematically precede credit booms. Reinhart and Rogoff (2013) report that large capital inflows and credit booms lead to banking crises.

A falling share of credit to the non-financial sector is also associated with lower growth (Beck et al., 2012; Bezemer et al., 2014) higher external imbalances and a larger probability of crisis (Büyükkarabacak and Krause, 2009; Büyükkarabacak and Valev, 2010). We therefore study whether capital flows are among the determinants of allocation of domestic bank credit between productive lending (to non-financial business) and other types of credit (mortgages and consumption credit).

How do Capital Flows Affect Domestic Credit Allocation?

In this section we discuss three factors which may determine the effect of capital inflows on domestic credit allocation. We follow Borio and Disyatat (2011) in focusing on financial inflows, not net flows or current account positions.

A first factor is a sectoral destination. The effect of capital inflows on credit allocation may run through the non-bank sector of the economy (changing demand for bank loans) or the bank sector (altering and loosening credit conditions). The non-bank channel is likely to be the most direct one, but a key element in the operation of either channel is bank credit creation which, as Borio and Disyatat (2011) stress, is a defining feature of a monetary economy. First, foreign capital can serve as a substitute for domestic productive lending, so that less domestic credit is allocated to the non-financial business. Second, capital inflows to non-banks increase banks' deposit liabilities to non-banks which allows for the creation of more loan assets. If meanwhile there are no improvement in the economy's investment opportunities in the sense of Rodrik and Subramanian (2009), then additional lending is unlikely to go to non-financial business and more likely to become mortgages and consumption credit. In addition, once this starts, rising real estate collateral values may create a feedback loop to more mortgage lending.

A second factor is a current account position. Surplus countries with strong export sectors are less likely to be investment-constrained in the sense of Rodrik and Subrama-

nian (2009) and more likely to utilize capital inflows productively by channeling them into credit for non-financial business. Meanwhile, deficit countries are more likely to be investment-constrained and to use capital inflows unproductively. Additionally, if financial inflows allow lower interest rates, less exchange rate appreciation and higher inflation, then deficit economies can sustain credit booms — and, therefore, credit misallocation — for longer than would otherwise be the case (Obstfeld, 2012). Thus, capital inflows into deficit economies are expected to reduce bank credit in support of Giavazzi and Spaventa's (2010) 'productive investment', which we capture by the share of credit allocated to non-financial business.

A third factor which determines if capital inflows change domestic bank credit allocation is monetary union. Negative externalities of capital inflows within a monetary union are, in principle, not different from capital inflow effects in general — real effective exchange rate appreciations through price and wage increases and expansion of the nontradables sector and/or asset markets. Additionally, a monetary union is likely to strengthen the link between capital inflows and domestic credit allocation.

More financial integration led to larger capital flows within the euro area (Lane, 2006; Spiegel, 2009; Lane, 2013). As a result, non-banks can borrow more easily abroad within EMU and banks have easier access to international interbank markets (Obstfeld, 2012). Cross-border access to finance is further enhanced by the absence of exchange rate risk and (in the case of EMU) borrowing at low costs of the strongest creditor economies. The accumulation of intra-EMU TARGET accounts signified large cross-border cash flows (Obstfeld, 2012, p.16). Chen et al. (2013) document that the increase in net external financing to EMU debtor countries was largely due to an increase in within-EMU capital flows. Also debt flows and equity investment into the banking sector increased enormously (Giavazzi and Spaventa, 2010). EMU membership also increases capital inflows into banks, as it eases access to the international interbank market and allows issuing commercial papers or bonds to finance loans. Again, unless domestic business invest-

ment opportunities have also increased, this larger loan supply is likely to translate into loans other than to non-financial business.

Finally, it is important to note that the effects of financial integration are observable not just during EMU membership, but also in the run-up to it. Becoming a member of the euro area is not a singular policy that can be easily put in place; it usually involves a preparation period during which countries adjust their institutions and economic fundamentals for EMU membership. In the seminal paper by Blanchard and Giavazzi (2002) on the effects of Euro introduction, the authors show that their variable of interest (the savings-consumption correlation) declined already before the Euro was introduced. Similarly, institutional changes connected to EMU which made large capital flows possible pre-dated the formal Euro introduction. After the 1992 Maastricht Treaty, future EMU countries started liberalizing both their domestic financial markets and capital accounts, well before they became EMU members. Their capital inflows rose accordingly.³ The surge in capital flows in the EMU and the easing of borrowing constraint both for the bank and non-bank sectors contributed to the credit boom in the euro area (Lane, 2013). It is plausible that this also affected the allocation of domestic credit.

Based on the literature discussed in this section, we will make the following distinctions in the analysis of capital inflows and domestic credit allocation: (i) between current account surplus and deficit economies; (ii) between inflows into bank and non-bank sectors; and (iii) between (future) EMU members and other economies.

³For instance, Greece implemented extensive liberalization policies between 1993 and 1997 in anticipation of EMU stage II (fixed exchange rates) in 1999 and stage III in 2001. Its quarterly capital inflows rose from a stable 0.5 bln Euro until 1993 to 1.0 bln over 1994–2000. Source: Greek flow-of-fund data.

3 Data

3.1 Description of the dataset

Our dataset covers 38 countries over the period 1990–2011, with the time period dictated by data availability. The country sample includes 26 (eventual) EU member countries – of which 16 EMU member-states – plus 12 other OECD economies (see Table 1).⁴

Our dependent variable is 'productive credit allocation'. This is based on data newly collected from national central bank statistics on the consolidated balance sheets of Monetary Financial Institutions. Four types of bank credit are distinguished: credit to non-financial business, credit to financial business (insurance companies, pension funds, and other non-bank financial institutions), household consumer credit, and mortgages to households. We define domestic 'productive credit allocation' as the percentage share of credit to non-financial business in total bank credit.

Data on capital inflows was collected from the IMF Balance of Payments (BoP) Statistics database. Bank and non-bank inflows are constructed as the sum of portfolio equity, portfolio debt, and other investment (loans) into banking and non-banking sectors. Following the IMF methodology, bank inflows are defined as capital inflows into deposit-taking corporations except the central bank. Non-bank inflows are capital inflows into other private sectors, namely other financial corporations, non-financial corporations, households, and non-profit institutions serving households.⁵ Due to the lack of data for FDI by sectors of the economy, we were not able to separate FDI inflows into bank and non-bank investment. Therefore, we use total FDI inflows into all sectors. All capital inflows are measured as a percentage of nominal GDP.

⁴New Zealand was dropped from the OECD group as there was no data available on bank and non-bank inflows. Similar to other studies (e.g., Lane and McQuade, 2014), we exclude Luxembourg due to its extremely large annual capital inflows (up to 900% of GDP). Ireland is also an outlier with respect to very large bank and non-bank inflows. For this reason, it will be dropped in regressions.

⁵For details on classification and definition of institutional sectors, see IMF (2009), Balance of Payments and International Investment Position Manual.

Table 1: **List of countries included in the sample**

EU countries								
Country	EMU	Pre-EMU	Country	EMU	Pre-EMU liberalization	Country	EMU	Pre-EMU
Austria	1999	1991	Germany	1999	1970	Poland	–	–
Belgium	1999	1990	Greece	2001	1996	Portugal	1999	1993
Bulgaria	–	–	Hungary	–	–	Romania	–	–
Cyprus	2008	2004	Ireland	1999	1993	Slovakia	2009	2003
Czech Rep.	–	–	Italy	1999	1993	Slovenia	2007	2000
Denmark	–	–	Lithuania	–	–	Spain	1999	1993
Estonia	2011	1996	Latvia	–	–	Sweden	–	–
Finland	1999	1991	Malta	2008	2004	UK	–	–
France	1999	1993	Netherlands	1999	1974			
Non-EU countries								
Australia	Canada	Chile	Iceland	Israel	Japan	S. Korea	Norway	Turkey
Mexico	Switzerland	USA						

Notes: EMU columns show the official dates when EMU countries adopted the Euro (stage III of EMU). The Pre-EMU liberalization column show the dates when substantial pre-EMU liberalizations took place, based on the Chinn-Ito index.

Due to the high volatility of annual capital inflow data, we constructed 3-year non-overlapping periods of underlying annual data. We define an EMU variable which takes the value 1 if a country is an EMU member in at least one year during any 3-year period, and 0 otherwise. We also construct a pre-EMU dummy (pEMU, for short) which takes the value 1 if a country (i) is a future EMU member, and (ii) implements substantial liberalization of its capital account. Substantial liberalization is signaled by a substantial increase in the Chinn-Ito capital account liberalization index (Chinn and Ito, 2008).⁶ The pEMU dummy takes the value 1 in the first 3-year period after that change and thereafter, and value 0 in earlier periods (pEMU remains equal to 1 after a country becomes an EMU member).

In illustration, Figure A.4 shows the evolution of the Chinn-Ito index for four EMU countries — Malta, Greece, Portugal, and Spain. We observe significant ‘jumps’ in the index several years before the countries officially became EMU members. Figure A.5 presents credit allocation in those countries for 3 years before and after these liberaliza-

⁶We found that for most future EMU countries, there was a one-off, large change in the index somewhere between 1991 and 1996 for 9 EMU countries, and between 2000 and 2004 for 4 other EMU economies. We do not observe this post-1990 for Belgium, Germany, and the Netherlands, which had already liberalized their capital accounts in the 1980s.

tions took place. The graph suggests that the non-financial credit share declined substantially in all examined countries after the liberalization wave. For instance, the share of bank credit to non-financial business decreased in Portugal from 63% in 1990–1992 to 52% in 1993–1995, while in Greece it dropped from 82% in 1993–1995 to 77% in 1996–1998.

As controls we include the initial income level (log of real GDP per capita in constant 2005 USD, at the beginning of each 3-year period), CPI inflation rate, and the overnight money market interest rate. The latter serves as an indicator of money market conditions and risk perception. This data is compiled from Thomson Reuters Datastream and central bank statistics. We also create a current account position dummy, which takes the value 1 if a country has a current account surplus in a given period, and 0 if it has a deficit, based on the current account balance data from the IMF BoP statistics. A final control variable is the credit market deregulation index from the Fraser Institute’s Economic Freedom Indicators⁷, which is expected to correlate negatively with the share of bank credit to non-financial business.

Descriptive statistics for all variables are reported in Table A.1. Tables A.2–A.3 show correlations of non-financial credit share with all variables. There is a negative correlation between the non-financial credit share and all categories of capital inflows, lagged one period. However, this correlation is statistically significant only for non-bank inflows.

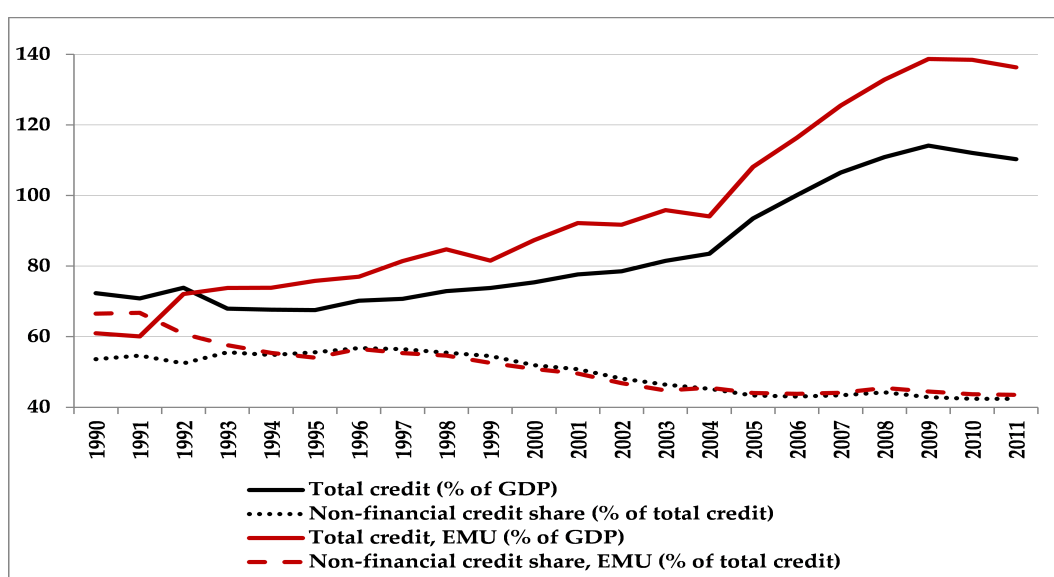
3.2 Data trends

We observe that the ratio of total bank to GDP in the full, unbalanced sample increased rapidly, from 72% of GDP in 1990 to 110% in 2011 (see Figure 1). In EMU countries

⁷The index consists of three components: ownership of banks (percentage of deposits held in privately owned banks), extension of credit (share of private sector credit in total bank credit), and presence of interest rate controls/negative interest rates. Each component is scaled from 1 to 10; the credit deregulation index is an average of the components. Higher values of the deregulation index indicate less regulation of credit markets. More deregulated credit markets are likely to experience more rapid credit growth (Giannone et al., 2011; Lane and McQuade, 2014), which typically implies less credit for non-financial investments.

total credit increased more dramatically, from 61% in 1990 to 136% in 2011. Moreover, credit allocation changed. The share of credit to non-financial business in the full sample declined over 1990–2011 from 54% to 42% of total bank credit. Meanwhile, EMU countries experienced a larger decline in this share, from 67% to 44%. After 2008 the non-financial credit share continued declining, but growth of the total credit-to-GDP ratio reversed.

Figure 1: **Total credit and non-financial credit share**

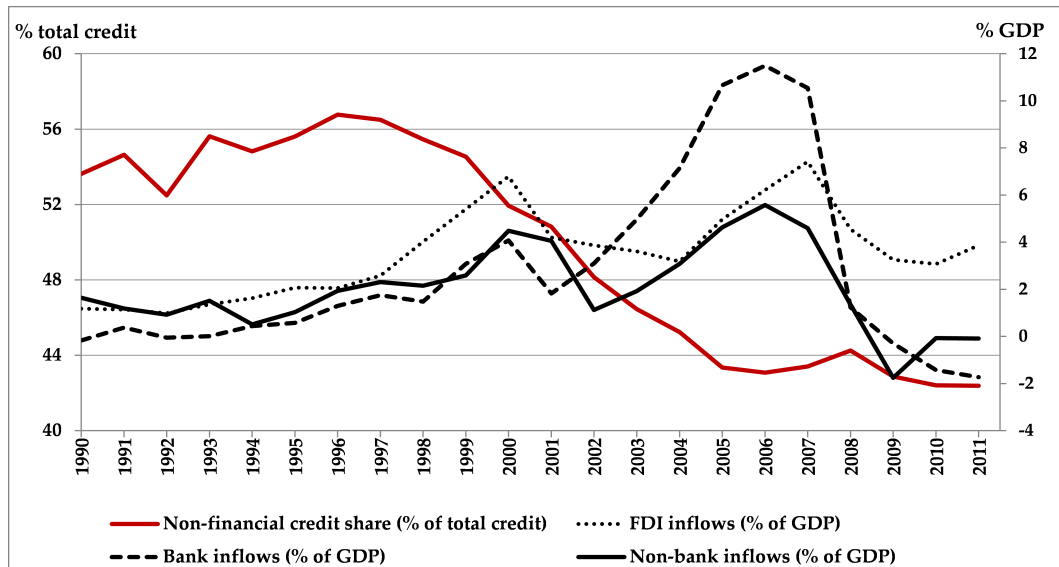


Source: Authors' calculations based on central banks statistics.

Figure 2 shows that the increase in capital inflows coincided with a decline in the non-financial credit share. From 1990 to 2007, total capital inflows increased by 20% of GDP, of which 11 percentage points (p.p.) due to the growth of bank inflows, 3 p.p. due to non-bank inflows, and 6 p.p. due to FDI. Meanwhile, the non-financial credit share decreased by 11 p.p. of total bank credit. The financial crisis in 2008–2010 led to capital flow reversals; on average from 2007 to 2011, total capital inflows decreased by 10% of GDP, mostly due to decline in bank inflows. Bank and non-bank equity and debt inflows were volatile and experienced the largest reversals; FDI flows were more stable.

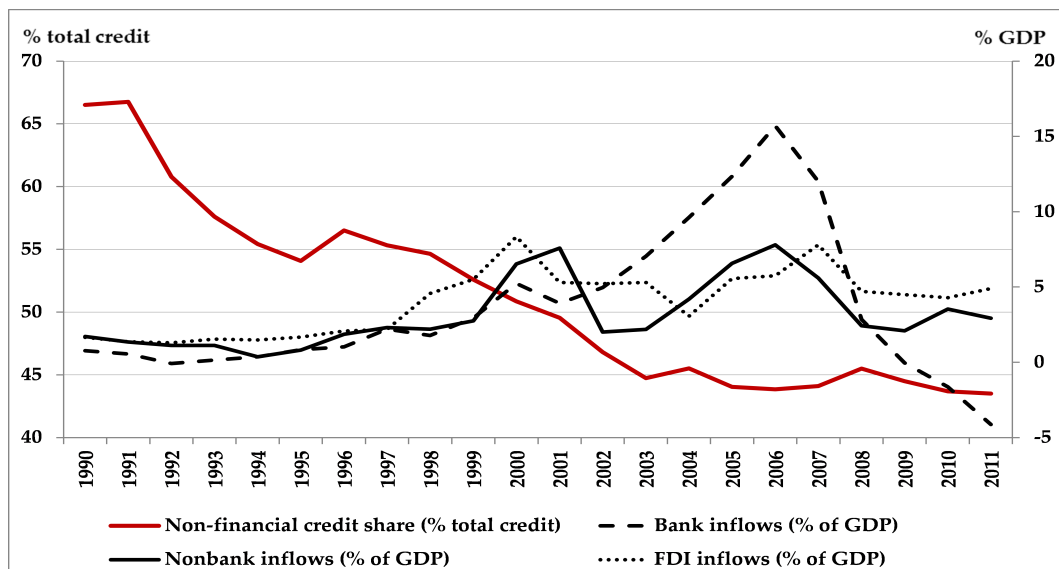
We observe similar trends for the EMU-only sample (Figure 3). The non-financial

Figure 2: Non-financial credit share and capital inflows, full sample



Source: Authors' calculations based on IMF BoP and central banks statistics.

Figure 3: Non-financial credit share and capital inflows, EMU countries



Source: Authors' calculations based on IMF BoP and central banks statistics.

credit share declined from the mid 1990s to 2011 from 55% to 43.5% on average, in the same years in which EMU economies absorbed large capital inflows, especially inflows into the banking sector.

In the Appendix (see Figure A.1) we discuss the structure and periodization of capital inflows.

Table 2: **Capital inflows by country subgroups**

Variable	Current account deficit		Current account surplus	
	EMU	non-EMU	EMU	non-EMU
Bank inflows (% of GDP)				
1990–2011	4.44	2.63	1.65	1.72
1990–1998	1.15	0.33	0.30	1.02
1999–2001	2.61	4.54	2.60	4.03
2002–2007	12.91	7.70	4.86	4.33
2008–2011	-0.81	1.29	-0.88	-2.75
Non-bank inflows (% of GDP)				
1990–2011	3.30	1.16	2.73	1.13
1990–1998	1.38	1.85	1.55	0.71
1999–2001	5.41	2.88	6.59	1.65
2002–2007	6.00	3.17	2.15	1.70
2008–2011	1.98	-4.70	3.34	0.83

Notes: Countries are classified as EMU if they became EMU members in any given year during the study period 1990–2011.

In Table 2 we compare average bank and non-bank inflows for EMU/non-EMU and for current account surplus/deficit economies, for 1990–2011 and for sub-periods. Over 1990–2011, deficit EMU economies attracted bank inflows equal to 4.4% of GDP per year, substantially more than did surplus EMU economies (1.7%). During the 2002–2007 capital flow boom years, that difference widened to 12.9% compared to 4.9%. Also non-bank inflows in deficit EMU members were almost three times larger than in surplus EMU economies. Further, the dispersion in non-bank inflows is smaller in deficit (3.3%) than in surplus (2.7%) EMU economies. Before EMU in 1990–1998, capital inflows appeared to be largely independent of current account status. Outside the EMU, capital inflows

over 1990–2011 were smaller overall, differences between surplus and deficit economies were negligible, and cross-country dispersion was moderate.

Table 3 reports trends in credit for five years (sample start, EMU-stage III start, capital flow boom start and end, and sample end). Average credit/GDP ratios over 1990–2011 are higher in EMU deficit countries than in EMU surplus or non-EMU deficit countries. The non-financial credit share is higher in EMU countries than in non-EMU countries, both for deficit and surplus economies. While in deficit EMU economies credit to non-financial business decreased sharply between 1990 and 2007 from 70% to 46% of all credit, in surplus EMU countries credit allocation changed less dramatically, from 55% to 39%.

Table 3: Total credit and credit allocation by country subgroups

Variable	Current account deficit		Current account surplus	
	EMU	non-EMU	EMU	non-EMU
Total credit (% of GDP)				
1990–2011	97.49	57.59	92.95	108.10
1990	55.56	68.43	77.16	94.09
1999	80.24	45.96	83.78	118.22
2002	95.76	46.43	88.89	116.42
2007	133.97	72.41	106.85	126.48
2011	146.15	77.59	120.02	111.13
Non-financial credit (% of total credit)				
1990–2011	53.11	50.52	46.63	45.85
1990	70.24	42.98	55.32	54.20
1999	55.34	62.00	47.75	42.44
2002	44.32	54.94	48.60	37.21
2007	46.28	45.48	39.32	37.95
2011	42.67	41.09	44.91	42.25

Notes: Countries are classified as EMU if they became EMU members in any given year during the study period 1990–2011.

It is important to note that credit data are unbalanced over time. Therefore, Figure A.3 (Appendix) shows the level and change in credit allocation in a balanced sample, in 7 deficit and 5 surplus EMU countries for which we have data on the non-financial

credit share from 2002 in all subsequent years.⁸ The graph suggests the same qualitative differences as just discussed, both in level of the non-financial credit share and its change.

4 Methodology

The aim of the analysis is to examine the impact of capital inflows on the non-financial credit share, conditional on (future) EMU membership, current account positions, type of capital inflows, and control variables. We use averages of the underlying annual data in 3-year non-overlapping periods, due to high volatility of capital inflows and in order to examine effects in the medium-run. We estimate system-GMM models, accounting for potential endogeneity of the regressors.

The baseline model specification is the following:

$$\begin{aligned} NFC_{it} = & \alpha + \beta_1 CRD_{it}^0 + \beta_2 EMU_{it} + \beta_3 CA_{it} + \kappa INF_{i,t-1} \\ & + \theta(EMU_{it} \times INF_{i,t-1}) + \delta(CA_{it} \times INF_{i,t-1}) + \gamma X_{it} + \mu_i + \omega_t + \varepsilon_{it} \end{aligned} \quad (1)$$

where NFC_{it} is the average share of credit to non-financial business in all bank credit to the private sector of country i in period t . To control for initial financial development, we include the total credit-to-GDP ratio at the beginning of period t , CRD_{it}^0 . β_2 and β_3 are parameters capturing the effects of (future) EMU membership (EMU_{it}) and current account position (CA_{it}) on the non-financial credit share.

$INF_{i,t-1}$ is a matrix of explanatory variables related to capital inflows. Depending on the specification of inflows, this matrix will consist of one, two, or three variables. Our specifications include: (i) total capital inflows as the sum of FDI, bank and non-bank inflows; (ii) bank and non-bank inflows separately; and (iii) bank, non-bank, and FDI inflows separately. κ includes the estimated parameters for capital inflows. In a similar way we construct matrices for interaction terms of capital inflows with EMU dummies

⁸We could not include 4 deficit EMU countries — Cyprus, Ireland, Slovakia, and Slovenia — as their data for the non-financial credit share is available only from 2004/2005.

$(EMU_{it} \times INF_{i,t-1})$ and with the CA variable $(CA_{it} \times INF_{i,t-1})$. All categories of capital inflows are included in the model with a lag of one period.

X_{it} is a vector of control variables. μ_i are unobserved country-specific effects. We also include time dummies ω_t to control for time fixed effects. Finally, ε_{it} is the i.i.d. white noise error term with mean 0 and variance σ_ε^2 .

The model (1) may suffer from endogeneity, for instance, due to the inclusion of the initial level of total credit-to-GDP as a regressor.⁹ Therefore, we employ a panel system-GMM model.¹⁰ System GMM combines the regression equation (1) in levels with the equation in first differences. The endogenous variable CRD_{it}^0 is instrumented by its lags in the first-difference equation.¹¹

GMM estimation produces consistent and unbiased estimates, provided that the error term in the baseline equation (1) is not serially correlated and that the instruments, used to deal with endogenous regressors, are valid. In our empirical analysis, we conduct Hansen tests of over-identifying restrictions to check for the joint validity of instruments and tests for the second-order autocorrelation of the residuals. Obviously the system GMM estimator does not solve the endogeneity concerns completely, but given the data, it is the best available method to reducing the endogeneity bias in our model. One source of variation in GMM estimation results is the choice of lags for instrumenting the endogenous regressor. In our case, the results are not sensitive to the number of lags.

⁹High credit-to-GDP ratios tend to go together with low credit to non-financial business shares

¹⁰See Arellano and Bond (1991), Arellano and Bover (1995), and Blundell and Bond (1998) for a description of system GMM estimators.

¹¹Our estimation procedure for system GMM in STATA follows Roodman (2009). We use the `xtabond2` command; CRD_{it}^0 is included as a predetermined variable in `gmmstyle` and instrumented by its lags. To increase efficiency, we restrict the number of lags to 2 and collapse instrument sets. The remaining explanatory variables are included in `ivstyle` as strictly exogenous regressors. We apply the two-step efficient GMM with small-sample corrections to the covariance matrix estimate.

5 Empirical results

We conduct estimations in three periods: 1990–2010, 1990–2007, and 1999–2010. We use the period till 2007 in an attempt to isolate the effect of the 2008–2010 crisis years, which cannot be estimated as a separate period due to its short duration. Additionally, we are interested in any differences between estimates for pre-EMU years and for EMU years from 1999.¹² We exclude Ireland as an outlier on bank and non-bank capital inflows.

As a first step of our empirical analysis, we estimate equation (1) using total capital inflows as the sum of FDI, bank and non-bank inflows. The full regression results for system GMM estimations are reported in Table A.4 (Appendix). The findings suggest that total capital inflows increase credit allocation towards non-financial business. However, this impact is significant only in periods which include the post-2007 crisis years. Additionally, being an official EMU member is associated with a larger non-financial credit share, compared to non-EMU countries. In order to interpret the interaction terms, we calculate total marginal effects of capital inflows, conditional on (future) EMU membership and current account positions. Table 4 presents the marginal effects.

Table 4: **Marginal effects of total capital inflows**

	EMU dummy			Pre-EMU dummy		
	1990–2010	1990–2007	1999–2010	1990–2010	1990–2007	1999–2010
EMU=0	−0.052	0.402	0.060	0.016	0.336	0.034
EMU=1	−0.002	0.335	−0.004	0.073	0.214	0.053
CA=0	0.120**	0.650	0.143**	0.124*	0.515	0.143**
CA=1	−0.094	−0.019	−0.127	−0.098	−0.055	−0.119

Notes: The table reports average marginal effects of total capital inflows on the non-financial credit share, conditional on (future) EMU membership and CA positions. ***p<0.01, **p<0.05, *p<0.1.

In Table 4, we observe a possible impact of financial crisis as there are no significant marginal effects of capital inflows on credit allocation in the 1990–2007 sample. The

¹²We do not report results for the period 1999–2007 which we also estimated, as it reduced the sample size too much. These results are comparable to the 1990–2007 period and available on request.

significant positive effect of total inflows on the non-financial credit share for CA deficit countries in the 1990–2010 and 1999–2010 samples are therefore presumably driven by the post-crisis years. The results using a pre-EMU membership dummy are similar.

Next, we examine the impact of capital inflows distinguished by sectoral destination. We estimate the model separately for bank and non-bank inflows (see Table A.5 in the Appendix for regression results). The findings suggest that the effect of total inflows, reported in the first analysis, can be decomposed into a moderate positive effect of bank inflows and a strong negative effect of non-bank inflows. Inflows into the non-banking sector significantly reduce the non-financial credit share in all periods.

Table 5: Marginal effects of bank and non-bank inflows

	EMU dummy			Pre-EMU dummy		
	1990–2010	1990–2007	1999–2010	1990–2010	1990–2007	1999–2010
Bank inflows						
EMU=0	0.181**	0.696*	0.213***	0.160*	0.738**	0.177**
EMU=1	−0.096	2.364**	−0.032	−0.028	0.131	0.012
CA=0	0.302***	1.529***	0.306***	0.284***	1.023***	0.284***
CA=1	−0.207	0.420	−0.150	−0.225	−0.278	−0.165
Non-bank inflows						
EMU=0	−1.154***	−1.375***	−1.178***	−1.166**	−0.967**	−1.060**
EMU=1	−0.819	−0.880**	−0.398	−0.855*	−1.404***	−0.714*
CA=0	−1.445***	−1.468***	−1.026*	−1.458***	−1.659***	−1.127**
CA=1	−0.455	−0.936	−0.738	−0.392	−0.325	−0.593

Notes: The table reports average marginal effects of bank and non-bank inflows on the non-financial credit share, conditional on (future) EMU membership and CA positions. ***p<0.01, **p<0.05, *p<0.1.

Table 5 reports the marginal effects of bank and non-bank inflows. Inflows into the banking sector have a significant positive impact on non-financial credit share in non-EMU and deficit economies. This result holds for both EMU and pre-EMU dummy. Additionally, for the 1990–2007 period, in EMU countries bank inflows significantly increase credit allocation to non-financial business.

Apparently, the non-bank channel has a greater impact.¹³ Non-bank inflows in deficit economies decrease the share of bank credit to non-financial business, while non-bank

¹³Eichengreen (2010) notes the importance of this channel.

inflows into surplus economies do not: the current account effect matters indeed. The negative effect of these inflows is evident in both EMU and non-EMU economies, but the effect in EMU economies is strongest in the period 1990–2007. When we define EMU status as starting with the liberalizations indicated by the Chinn-Ito index change using the pre-EMU dummy, we find that the impact of non-bank inflows is significantly stronger in EMU than in non-EMU countries over 1990–2007. When we use a formal EMU membership dummy for the same period, we find no significant difference in the effect of non-bank inflows on domestic credit allocation between EMU and non-EMU economies. This finding supports the idea of an ‘effect of EMU before EMU’.

In a third analysis, we include FDI inflows together with bank and non-bank inflows. FDI is an important part of capital flows as it has a direct impact on productive investment. Hence, it could also play a role in changing domestic credit allocation. Regression results are available upon request. The findings suggest that FDI inflows do not have a significant impact on the non-financial credit share, while the effects of bank and non-bank inflows are similar to the estimations without FDI.

Table 6 presents the marginal effects. FDI inflows are insignificant regardless of EMU membership and CA positions. Including FDI does not change the other results. The effects of bank inflows on the non-financial credit share is still positive in non-EMU and deficit countries. Similar to previous analysis, for the 1990–2007 period, in EMU economies bank inflows increase the non-financial credit share. For non-bank inflows the results are comparable to those in Table 5.

Finally, we briefly discuss the results for control variables. The initial total-credit-to-GDP ratio significantly reduces the non-financial credit share. Thus, in this sample credit expansion leads to credit disallocation away from non-financial business and towards consumption and mortgages. Initial income level is significant only in one regression. The estimates of inflation and interest rate are insignificant as well. An interesting and robust result is that credit market deregulation has a strong negative effect on credit allocation.

Table 6: **Marginal effects of FDI, bank and non-bank inflows**

	EMU dummy			Pre-EMU dummy		
	1990–2010	1990–2007	1999–2010	1990–2010	1990–2007	1999–2010
FDI inflows						
EMU=0	0.091	0.205	0.101	0.084	−0.031	0.065
EMU=1	−0.011	−0.449	−0.076	−0.045	−0.227	−0.030
CA=0	0.239	0.281	0.187	0.184	0.108	0.152
CA=1	−0.217	−0.303	−0.191	−0.204	−0.431	−0.172
Bank inflows						
EMU=0	0.153**	0.713*	0.191**	0.134	0.742***	0.157
EMU=1	−0.115	2.566**	−0.028	−0.021	0.172	0.016
CA=0	0.248**	1.571***	0.267**	0.244**	1.015***	0.250**
CA=1	−0.187	0.509	−0.121	−0.194	−0.221	−0.139
Non-bank inflows						
EMU=0	−1.215***	−1.297***	−1.224***	−1.239***	−0.936**	−1.098**
EMU=1	−0.764	−0.562	−0.319	−0.803*	−1.279**	−0.679*
CA=0	−1.584***	−1.429***	−1.102**	−1.569***	−1.700***	−1.199**
CA=1	−0.311	−0.654	−0.629	−0.279	−0.092	−0.499

Notes: The table reports average marginal effects of FDI, bank, and non-bank inflows on the non-financial credit share, conditional on (future) EMU membership and CA positions. ***p<0.01, **p<0.05, *p<0.1.

As a sensitivity analysis, we tested whether the results are robust to the exclusion of different countries (results are available on request). Estimated marginal effects were largely robust to these modifications, except when excluding Ireland or Iceland. These two countries stand out from the sample as they experienced an extreme surge of capital inflows between 2005 and 2008. Excluding Ireland makes the effect of EMU and pre-EMU dummies less significant. Meanwhile, excluding Iceland leads to the insignificance of coefficient estimates and all marginal effects for bank inflows. Apparently, the observations for this particular country are driving most of results as far as bank inflows are concerned. The results for non-bank inflows remain robust to sample modifications.

6 Conclusion

EMU introduction caused large capital flows from member economies with trade surpluses to member economies with deficits. At the same time, there was a general decline

in domestic bank credit allocated to non-financial business. The literature has shown that this decline harms economic growth and stability (Büyükkarabacak and Krause, 2009; Bezemer et al., 2014).

This paper investigates whether EMU membership, through capital inflows, affects the shift away from bank lending to non-financial business. We construct a novel measure for ‘domestic bank credit allocation’, defined as the share of credit to non-financial business. This measure is based on newly collected data from consolidated balance sheets of domestic banks in 38 countries over 1990–2011. We observe large declines in this share both in the run-up to EMU in the 1990s and during EMU membership. We distinguish capital inflows according to their sectoral destination, i.e. bank and non-bank inflows. Additionally, we control for current account positions of countries.

We recognize that the impact of EMU on the relation between capital flows and domestic credit allocation existed not only during EMU, but also during preparation for EMU accession. Substantial changes in financial liberalization, capital flows, and credit allocation can be observed already during the 1990s in most of future EMU economies.

We explore the data and estimate system GMM regressions. We find that a decline in the non-financial credit share was significantly larger in those EMU economies, relative to non-EMU economies, which experienced more capital inflows into their non-bank sectors. We also find that pre-EMU status matters. Defining EMU status as starting with the pre-EMU financial liberalizations, we find that the non-bank inflows’ effect is significantly stronger in EMU than in non-EMU countries over 1990–2007. When we use a formal EMU membership dummy, there is no significant difference in the impact of non-bank inflows on credit allocation between EMU and non-EMU economies. This result supports the idea of an ‘effect of EMU before EMU’. Additionally, we find that non-bank inflows in deficit economies reduce the non-financial credit share, while bank inflows have generally a positive impact on credit allocation.

One policy implication of this study is that the influence of being in EMU should

be researched before the formal membership starts. The main policy relevant finding is that financial integration within EMU might have a detrimental effect on the productive allocation of domestic bank credit. This new channel may explain some of the much-debated effects of the Euro on intra-Eurozone imbalances. It also bears on the analysis of optimal currency areas, which does not include financial markets. These issues merit further research.

Acknowledgments

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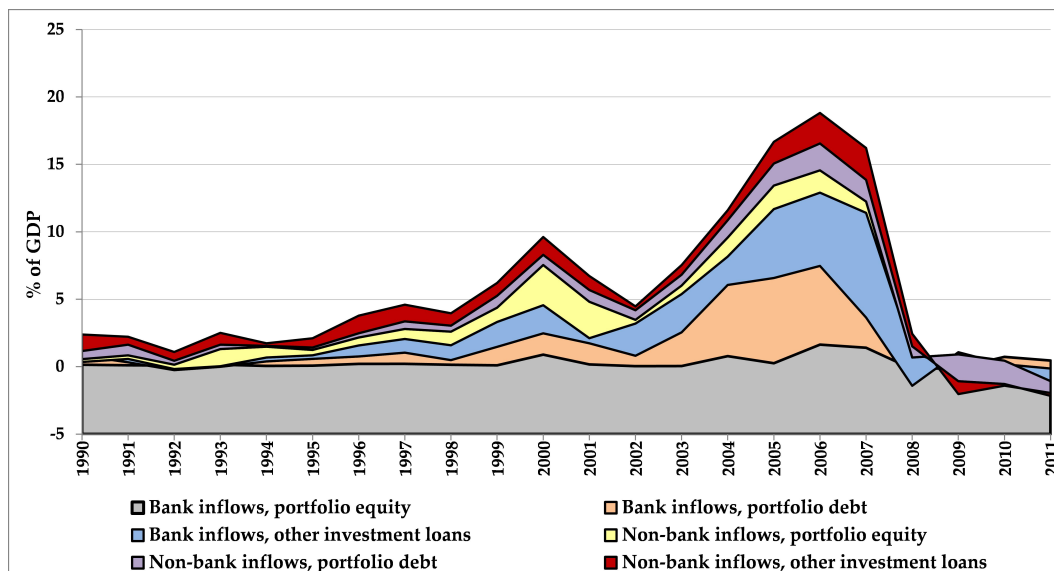
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Appendix

In Figure A.1 we disaggregate bank and non-bank inflows over 1990–2011 into portfolio equity, portfolio debt, and other investment loans. Bank inflows are larger in size and more volatile than non-bank inflows. Debt inflows, i.e. portfolio debt and other investment loans, constitute the largest share of bank inflows, while portfolio equity dominates in non-bank inflows. Moreover, debt inflows had higher volatility than equity, especially from 1999. These patterns are similar for the EMU countries sample (Figure A.2).

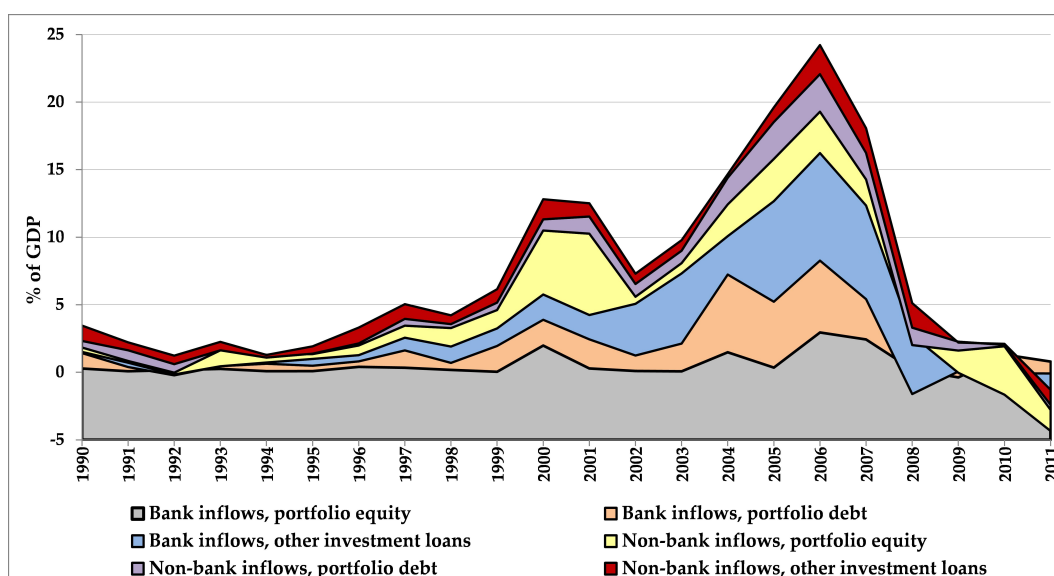
Figure A.1 suggests a periodization for capital inflows. First, the 1990–1998 pre-EMU years, with low and stable growth of capital inflows when average bank and non-bank inflows were equal 0.6% and 1.5% of GDP, respectively. Second, 1999–2001: the start of EMU in 1999 inaugurated faster growth of capital inflows. Bank inflows rose to 3% of GDP on average and non-bank inflows to 3.7%. The period 2002–2007 were the capital boom years. Both bank and non-bank inflows more than tripled in size relative to GDP, from 3% in 2002 to 10.5% of GDP in 2007 for bank inflows, and from 1% to 4.6% for non-bank inflows. Lane (2013) notes that the growth of international financial transactions in these years was more rapid than the growth in international trade of goods and services. A fourth period in our sample are the crisis years 2008–2011, which saw a remarkable drop in capital inflows. Bank debt flows declined most dramatically, from over 10% of GDP in 2007 to -2% in 2011.

Figure A.1: Composition of bank and non-bank inflows, full sample



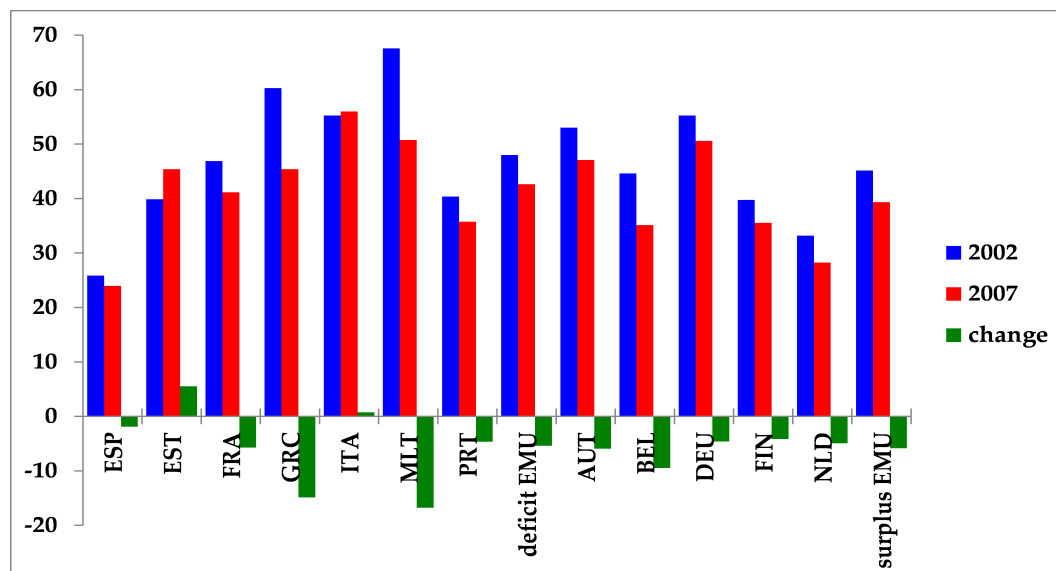
Source: Authors' calculations based on IMF Balance of Payments Statistics.

Figure A.2: Composition of bank and non-bank inflows, EMU countries



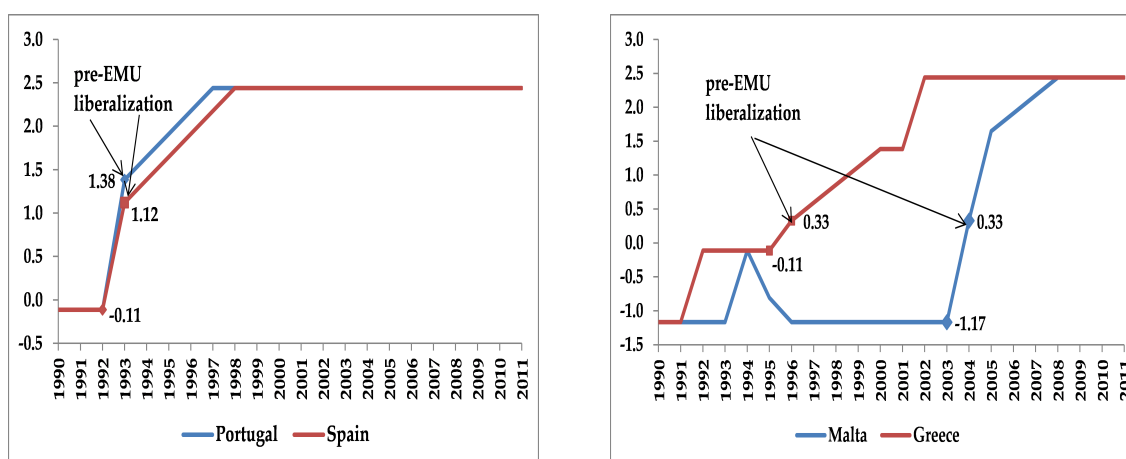
Source: Authors' calculations based on IMF Balance of Payments Statistics.

Figure A.3: Credit allocation in deficit and surplus EMU countries



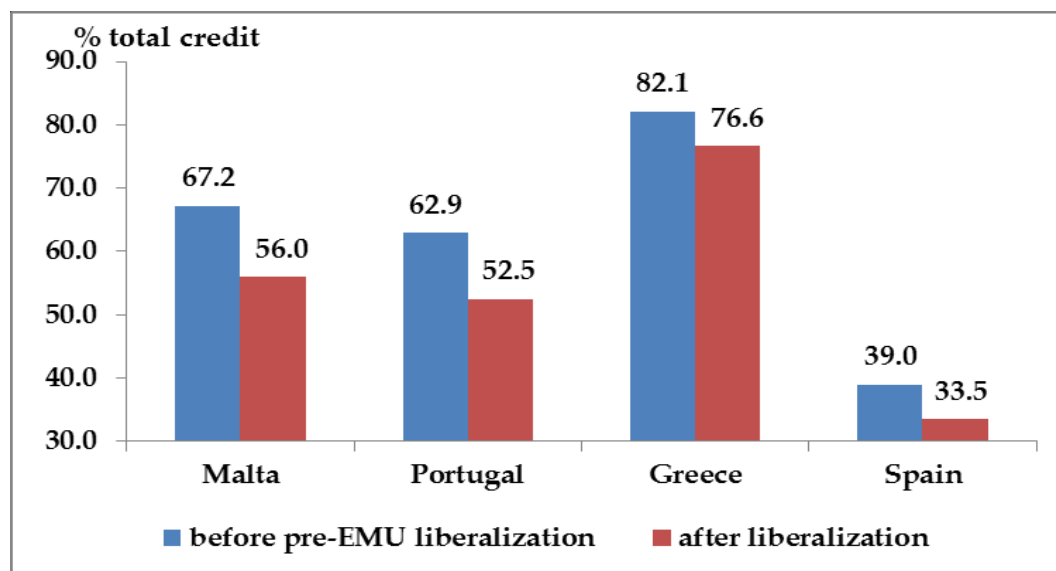
Source: Authors' calculations based on central banks statistics.

Figure A.4: Chinn-Ito capital account liberalization index



Source: Authors' calculations based on data of Chinn and Ito (2008).

Figure A.5: Credit allocation before/after pre-EMU liberalization



Source: Authors' calculations based on central banks statistics.

Table A.1: Descriptive statistics, 1990–2010 (3-year periods)

Variable	Unit	No. obs.	Mean	Sd	Min	Max
Credit variables						
Non-financial credit	% of total credit	193	48.92	17.33	18.64	98.33
Initial total credit	% of GDP	179	85.05	53.84	2.56	379.89
Capital Inflows						
Total inflows	% of GDP	239	9.25	17.47	−63.44	142.25
FDI inflows	% of GDP	255	3.59	3.94	−2.85	25.40
Bank inflows	% of GDP	240	3.24	10.79	−28.29	100.63
Non-bank inflows	% of GDP	250	2.23	8.20	−75.60	66.32
Control variables						
Initial GDP per capita	In log	188	9.91	0.77	7.77	11.11
Inflation	%	205	8.43	32.17	−0.60	399.55
Overnight interest rate	%	195	7.83	16.77	0.00	148.91
Credit market deregulation	1 to 10	206	8.39	1.53	1.47	10
Current account position	0/1	260	0.35	0.48	0	1
EMU membership	0/1	260	0.19	0.39	0	1
Pre-EMU	0/1	260	0.33	0.47	0	1

Table A.2: Correlations of non-financial credit share with capital inflows (lagged one period)

	Non-financial credit	Total inflows	FDI inflows	Bank inflows	Non-bank inflows
Non-financial credit	1.00				
Total inflows	−0.09	1.00			
FDI inflows	−0.05	0.57***	1.00		
Bank inflows	−0.03	0.93***	0.42***	1.00	
Non-bank inflows	−0.15**	0.77***	0.23***	0.54***	1.00

Note: The table reports pairwise correlation coefficients (see regression results). ***p<0.001, **p<0.05, *p<0.1.

Table A.3: Correlations of non-financial credit share with other explanatory variables

	Non-financial credit	Initial total credit	GDP p.c.	Inflation	Interest rate	Credit mkt deregul.	CA position	EMU	Pre-EMU
Non-financial credit	1.00								
Initial total credit	−0.47***	1.00							
GDP per capita	−0.59***	0.56***	1.00						
Inflation	0.38***	−0.16**	−0.37***	1.00					
Interest rate	0.49***	−0.25***	−0.43***	0.85***	1.00				
Credit mkt deregul.	−0.66***	0.27***	0.43***	−0.40***	−0.46***	1.00			
CA position	−0.22***	0.30***	0.46***	−0.02	−0.11	0.26***	1.00		
EMU membership	−0.14*	0.29***	0.26***	−0.11	−0.18**	0.17**	0.11*	1.00	
Pre-EMU	−0.07	0.22***	0.22***	−0.14**	−0.21***	0.12	0.07	0.68***	1.00

Note: The table reports pairwise correlation coefficients. ***p<0.01, **p<0.05, *p<0.1.

Table A.4: Credit allocation and total capital inflows, system GMM estimation results

	EMU dummy			Pre-EMU dummy		
	1990–2010	1990–2007	1999–2010	1990–2010	1990–2007	1999–2010
Total credit ₀	–0.160 ** (0.070)	–0.285 ** (0.123)	–0.150 ** (0.060)	–0.158 ** (0.070)	–0.251 ** (0.110)	–0.162 ** (0.067)
EMU	6.287 * (3.343)	6.061 * (3.069)	5.023 * (2.952)	3.774 (3.625)	3.611 (3.786)	4.287 (4.088)
Total capital inflows	0.129 ** (0.058)	0.648 (0.467)	0.156 *** (0.053)	0.103 (0.063)	0.561 (0.536)	0.138 ** (0.065)
EMU×Total inflows	–0.039 (0.104)	0.010 (0.179)	–0.042 (0.112)	0.054 (0.101)	–0.122 (0.323)	0.011 (0.117)
CA	6.654 * (3.579)	9.859 ** (4.574)	5.465 (3.440)	6.533 * (3.532)	8.790 ** (4.313)	6.095 * (3.548)
CA×Total inflows	–0.212 (0.140)	–0.670 (0.438)	–0.266 ** (0.112)	–0.221 (0.139)	–0.570 (0.443)	–0.261 ** (0.117)
GDP per capita ₀	–5.451 (4.974)	–0.922 (4.995)	–5.294 (4.151)	–4.728 (4.239)	–1.462 (4.055)	–4.322 (4.419)
Inflation	–0.034 (0.029)	0.001 (0.029)	–0.028 (0.031)	–0.031 (0.028)	–0.001 (0.027)	–0.020 (0.031)
Overnight interest rate	0.122 (0.080)	0.045 (0.077)	0.104 (0.074)	0.132 * (0.076)	0.059 (0.073)	0.087 (0.075)
Credit market deregulation	–4.598 *** (1.146)	–5.758 *** (1.338)	–3.515 ** (1.320)	–4.633 *** (1.126)	–5.712 *** (1.296)	–3.808 *** (1.272)
Observations	150	114	122	150	114	122
Countries	36	34	36	36	34	36
Hansen test p-value	0.21	0.65	0.92	0.31	0.68	0.68
AR(2) test p-value	0.52	0.39	0.16	0.19	0.25	0.10

Notes: The table reports coefficient estimates with robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Constant term, time dummies, and country-fixed effects are included in the estimations but not reported. AR(2) is the Arellano-Bond test for second-order serial correlation of residuals. The Hansen test reports the Hansen over-identification statistic.

Table A.5: Credit allocation, bank and non-bank inflows, system GMM estimation results

	EMU dummy			Pre-EMU dummy		
	1990–2010	1990–2007	1999–2010	1990–2010	1990–2007	1999–2010
Total credit ₀	−0.114 ** (0.054)	−0.291 (0.176)	−0.130 ** (0.049)	−0.109 * (0.056)	−0.175 (0.115)	−0.128 ** (0.054)
EMU	4.312 (3.317)	−0.551 (3.545)	3.243 (2.567)	2.005 (3.848)	2.499 (3.198)	3.861 (3.681)
Bank inflows	0.363 *** (0.067)	1.161 ** (0.509)	0.371 *** (0.072)	0.359 *** (0.072)	1.251 *** (0.348)	0.358 *** (0.079)
Non-bank inflows	−1.511 *** (0.417)	−1.557 *** (0.346)	−1.260 ** (0.513)	−1.584 *** (0.511)	−1.494 *** (0.364)	−1.277 * (0.641)
EMU×Bank inflows	−0.242 ** (0.111)	1.811 ** (0.800)	−0.210 * (0.124)	−0.194 (0.169)	−0.606 (0.496)	−0.178 (0.181)
EMU×Non-bank inflows	0.265 (0.929)	0.438 (0.763)	0.760 (0.800)	0.324 (0.738)	−0.438 (0.825)	0.362 (0.659)
CA	2.628 (3.499)	5.480 (4.232)	3.522 (3.344)	2.243 (3.318)	3.973 (3.343)	3.179 (3.521)
CA×Bank inflows	−0.495 *** (0.147)	−1.264 *** (0.427)	−0.440 *** (0.134)	−0.511 *** (0.150)	−1.301 *** (0.367)	−0.454 *** (0.140)
CA×Non-bank inflows	0.974 (0.850)	0.494 (0.868)	0.230 (0.850)	1.069 (0.652)	1.335 (0.837)	0.545 (0.718)
GDP per capita ₀	−6.497 * (3.615)	−0.219 (5.881)	−5.794 (3.626)	−6.081 (3.753)	−4.171 (4.060)	−5.268 (3.841)
Inflation	−0.030 (0.025)	0.025 (0.041)	−0.015 (0.026)	−0.027 (0.024)	0.001 (0.027)	−0.011 (0.026)
Interest rate	0.115 (0.070)	0.001 (0.083)	0.077 (0.062)	0.119 * (0.065)	0.038 (0.069)	0.068 (0.061)
Credit market deregulation	−4.304 *** (1.259)	−5.487 *** (1.364)	−3.545 *** (1.379)	−4.305 *** (1.222)	−5.610 *** (1.266)	−3.835 *** (1.288)
Observations	150	114	122	150	114	122
Countries	36	34	36	36	34	36
Hansen test p-value	0.15	0.32	0.72	0.20	0.24	0.48
AR(2) test p-value	0.50	0.26	0.20	0.32	0.77	0.11

Notes: The table reports coefficient estimates with robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Constant term, time dummies, and country-fixed effects are included in the estimations but not reported. AR(2) is the Arellano-Bond test for second-order serial correlation of residuals. The Hansen test reports the Hansen over-identification statistic.

Table A.6: Credit allocation, FDI, bank and non-bank inflows, system GMM estimation results

	EMU dummy				Pre-EMU dummy			
	1990–2010	1990–2007	1999–2010	1999–2010 **	1990–2010	1990–2007	1999–2010	1999–2010 **
Total credito	–0.113 ** (0.055)	–0.289 (0.177)	–0.130 ** (0.050)		–0.108 * (0.057)	–0.166 (0.106)	–0.127 ** (0.056)	
EMU	4.614 (3.614)	0.819 (3.124)	3.741 (2.783)		2.134 (4.270)	2.893 (3.350)	2.970 (4.235)	
FDI inflows	0.257 (0.420)	0.401 (0.504)	0.232 (0.367)		0.236 (0.625)	0.182 (0.654)	0.195 (0.589)	
Bank inflows	0.307 *** (0.091)	1.167 ** (0.494)	0.325 *** (0.099)		0.307 * (0.151)	1.229 *** (0.334)	0.314 ** (0.154)	
Non-bank inflows	–1.675 *** (0.363)	–1.561 *** (0.344)	–1.370 *** (0.420)		–1.746 *** (0.446)	–1.570 *** (0.402)	–1.381 ** (0.538)	
EMU×FDI inflows	–0.069 (0.467)	–0.594 (0.542)	–0.147 (0.409)		–0.133 (0.509)	–0.196 (0.485)	–0.105 (0.475)	
EMU×Bank inflows	–0.237 (0.170)	1.993 ** (0.902)	–0.189 (0.155)		–0.160 (0.198)	–0.569 (0.507)	–0.153 (0.208)	
EMU×Non-bank inflows	0.361 (1.037)	0.654 (0.895)	0.872 (0.872)		0.452 (0.707)	–0.345 (0.898)	0.441 (0.604)	
CA	2.994 (3.740)	6.660 (4.635)	4.317 (3.599)		2.615 (3.419)	4.849 (3.846)	3.797 (3.674)	
CA×FDI inflows	–0.453 (0.522)	–0.533 (0.585)	–0.366 (0.451)		–0.389 (0.449)	–0.539 (0.599)	–0.327 (0.407)	
CA×Bank inflows	–0.420 ** (0.192)	–1.233 *** (0.432)	–0.373 ** (0.168)		–0.440 ** (0.208)	–1.235 *** (0.366)	–0.394 * (0.198)	
CA×Non-bank inflows	1.252 (0.812)	0.718 (0.814)	0.407 (0.817)		1.296 ** (0.616)	1.608 * (0.790)	0.713 (0.681)	
GDP per capita ₀	–5.736 * (3.348)	–0.061 (6.317)	–5.449 (3.333)		–5.489 (3.269)	–4.434 (3.955)	–4.991 (3.414)	
Inflation	–0.033 (0.027)	0.019 (0.041)	–0.019 (0.028)		–0.029 (0.026)	–0.005 (0.028)	–0.014 (0.028)	
Interest rate	0.135 * (0.069)	0.020 (0.077)	0.087 (0.064)		0.133 ** (0.063)	0.053 (0.066)	0.075 (0.060)	
Credit market deregulation	–4.445 *** (1.256)	–5.404 *** (1.370)	–3.621 ** (1.361)		–4.381 *** (1.222)	–5.441 *** (1.295)	–3.908 *** (1.269)	
Observations	150	114	122		150	114	122	
Countries	36	34	36		36	34	36	
Hansen test p-value	0.11	0.39	0.70		0.17	0.29	0.45	
AR(2) test p-value	0.56	0.26	0.22		0.36	0.92	0.13	

Notes: The table reports coefficient estimates with robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Constant term, time dummies, and country-fixed effects are included in the estimations but not reported. AR(2) is the Arellano-Bond test for second-order serial correlation of residuals. The Hansen test reports the Hansen over-identification statistic.

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